CRUISE REPORT

k/V NEECHO 81-1

January 6 - 18, 1981

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U.S. Geological Survey
Woods Hole, Mass. 02543

Vessel: R/V NEECHO 81-1

Dates: Launch at Memphis, Tenn. January 6, 1981
Retrieve at Wycliff, Ky. January 19, 1981

Purpose: To conduct a continuous 12-channel CDP seismic-reflection profile along the Mississippi River from Osceola, Ark. to the vicinity of Cairo, Ill.

Areas studied: Main channel of the Mississippi adjacent to Tennessee, Arkansas, Kentucky, and Missouri, from Osceola, Ark. to Wycliff, Ky.

Project: Marine Seismic Operations (9840-01796)

Scientific cooperation: This project was carried out with the financial and scientific cooperation of David P. Russ, Branch of Earthquake Tectonics and Risk, USGS, Golden, Col. Russ determined the length of the survey and arranged for its financial support through a variety of funding agencies. Samuel T. Harding, Branch of Earthquake Tectonics and Risk served as a crew member and helped establish the technical parameters by which the data would be acquired. Harding also served as liaison between R/V NEECHO and Russ.

Scientific party: Dennis O'Leary - Chief scientist
Frank Jennings - Electronic technician
David Nichols - DFS V operator
Paul Loud - Boat operator
Donald Smith - Shore coordinator/van driver
Samuel Harding - Scientist

Scientific equipment:

1. DFS V 12-channel DCP seismic-reflection system
2. EPC strip chart recorder
3. Raytheon echosounder
4. 40 in^3 airgun
5. 120-element multichannel streamer
6. Hydrophone monitor

Navigation: Repetitive line-of-sight readings to obtain resection from azimuths to identifiable landmarks (e.g., grain elevators, navigation lights, mile markers, revetment ends, groin ends). A simple compass-sighting device was used.

Tabulated information:

Days on the river - 13
Kilometers of trackline - 133.3
Number of scientific party - 6

Remarks: The Neecho was run up to Osceola, Ark. on January 7, from which point the survey was to begin. On January 8 a few practice runs were made up the river to test the gear and the method of recording navigation. A sample of the data was taken by Russ to Denver for procesing to check on the procedure. It was determined to cruise upstream at about 4 kns to maintain heading and keep the streamer straight. The airgun was towed at a depth of nearly 2 m; the first group of hydrophones was placed about 40 m to stern; shots were made every 5 seconds. Although the weather was generally excellent, the river was extremely low. We ran aground twice and had noise and navigation problems with tow boats. The dikes and groins projecting into the channel caused some spurious reflections in the monitor record.

At about 1600 January 12, the compressor was shut down because of internal noise. It was judged that this was a serious situation - probably a loose con rod. We had flown out to us the minisparker and rigged it up inside a polyethylene sleeve sealed at each end and filled with salt water. The sparker did not work properly, but in the meantime the compressor problem was fixed. A total of two days was lost. In order to reach Wycliff (out take-out point) just before dark on January 18 (our last day) we terminated the survey at mile 197 (about 8 km north of Hickman, Ky.). However, we could not have surveyed much beyond mile 197 because of traffic congestion caused by the shallow, constricted channel, dredging operations, and ice above Cairo.